

Enrique Valderrama, Ph.D.

Curriculum Vitae

Work Address:

Oral Roberts University (ORU)
Computing and Mathematics Department
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Career

Associate Professor of Mathematics, Oral Roberts University, Tulsa, Oklahoma-USA:

August 2019 ~ Now:

Associate Professor of Mathematics:

Adviser of Mathematics with a Data Science Concentration.

Lecturer and Laboratory instructor for:

- + Calculus I (MAT 201)
- + Calculus III (MAT321)
- + Discrete Mathematics (MAT 207)
- + Elementary Discrete Mathematics (MAT 208)
- + Elementary Statistics (MAT 232)
- + Probability and Statistics (MAT 325)
- + Introduction to Computing (CSC111)

Research and Development:

- + Statistical Analysis of Fitbit DATA from ORU students.
- + Design of an Ultra High Vacuum System for the production of metallic coatings and nanoparticle decoration.
- + Construction and Assembly of a Physical Vapor Deposition (PVD) coater.
- + Design, Simulation and Construction of a Pulse Forming Network to drive a PVD coater.
- + Design of an Infrared Heater for the PVD coater.
- + Co-PI for NSF proposal: "Acquisition of Shared High-Performance Compute Cluster for Multidisciplinary Computational and Data-Intensive Research and Training".

Director of the Advanced Materials Dep., Yes! Clean Energy LLC, Newport News, Virginia-USA:

July 2017 ~ July 2019:

Research, Development and Marketing:

- + Program Manager for design, manufacturing and evaluation of an automated cluster for the prototyping of All Solid-State Lithium Thin-film batteries.

- + Research and Development on Lithium and Lithium Titanate Oxide($\text{Li}_4\text{Ti}_5\text{O}_{12}$) sputtered coatings as Anode material for Advanced Lithium Batteries.
- + Research and Development on Lithium Cobalt Oxide(LCO) sputtered coatings as Cathode material for Advanced Lithium Batteries.
- + Research and Development on Phosphorous OxyNitride (LiPON) sputtered coatings as solid-state Electrolyte material for Advanced Lithium Batteries.
- + Design and Modelling of Magnetron Sputtering systems for balanced and unbalanced configurations.
- + Research and development of mass production of Vertical Graphene by Plasma-Enhanced Chemical Vapor Deposition.
- + Design of advanced materials for biosensor applications using Vertical Graphene, Conductive Polymers, Enzymes, Platinum, Gold, Palladium and Nickel nanoparticles.

Affiliated Scientist at the College of William and Mary, Williamsburg, Virginia-USA:

July 2017 ~ July 2020:

Research:

- + Design of a Multicoater system using all PVD sources for the production of all-solid-state thin-film batteries.
- + R&D on plasmas of radiofrequency for magnetron-sputtering of Lithium Cobalt Oxide (LCO) as cathode material for solid-state batteries. Physical and Chemical characterization.
- + R&D on plasmas of radiofrequency for -magnetron-sputtering of solid-state electrolyte Lithium Phosphorous OxyNitride (LiPON). Physical and Electro-Chemical characterization.
- + R&D on Electroplating of Lithium Cobalt Oxide. Physical and Chemical characterization.
- + R&D of Biosensors based in Vertical Graphene. Physical and ElectroChemical characterization.

Associate Professor, part time at **ORU**, (online):

July 2012 ~ Now:

Lecturer for:

- + Principles of Physical Science Lecture and Lab. (LPSC 101).
- + Trigonometry (MAT 106).
- + Mathematics and Society (LMAT 151).
- + Elementary Statistics (LMAT 232).
- + College Algebra (LMAT 105).

Assistant Professor of Physics, full time at **ORU**, OK-USA:

Jul 2013 ~ Jul 2017:

Adviser of Mathematical Physics Major.

Lecturer and Laboratory instructor for:

- + Computation of Plasma Physics (CIT 454 Special Topics).
- + Electromagnetic Theory (EE 360).
- + Mathematical Methods in Physics (PHY 455).
- + Calculus-I (MAT 201).
- + Calculus-II (MAT 202).

- + Calculus-III (MAT 321).
- + General Physics (PHY 101).
- + Physics I (PHY 111).
- + Physics II (PHY112).
- + Modern Physics (PHY 211).

Research:

- + Space thrusters using solid targets as propellant. A vacuum arc will vaporize and ionize the solid target to produce a metallic plasma plume. The vacuum arc it is drive by a pulse forming network of 120 microseconds.
- + Langmuir probe design, construction and characterization of plasma plumes.
- + Schlieren optical diagnostic design and construction to the study of the metallic plasma plume of a vacuum arc thruster.
- + Circuit Modelling and Computer Simulation of Hollow Cathode Discharge (HCD) and micro-hollow cathode discharge(MHCD) by Particle In Cell(PIC) method.
- + Implementation of plasma simulation outputs to virtual reality peripherals.
- + Undergraduate research for self-assembled layer of silver nanoparticles.
- + Undergraduate research for design and construction of a spin-coater.
- + Undergraduate research for chemical and physical synthesis of silver nano-particles.

Previous undergraduate research projects:

- + Researcher in mathematics modelling for drug-solubility prediction in water-ethanol mixtures.
- + Researcher and advisor for senior-project on silver nanoparticle coating for biomedical applications. Senior research report name: "Synthesis and Utilization of Silver Nanoparticles in the Medical Field".

Assistant Professor, part time at **ORU**, OK-USA:

Jul 2012 ~ Jul 2013: Professor of Lecture and Laboratory for: Calculus II (MAT 202), Elementary statistics (MAT 232), Earth and Sciences (PSC 201), Math and Society (MAT 151), and Principal of Physical Sciences (LPSC 101).

Research Scientist on *Alameda Applied Sciences Corporation (AASC)*, CA-USA:

Feb 2010 ~ Feb 2012: Scientist reporting directly to CEO, Dr. M. Krishnan.

Mission: Develop advanced materials, particularly thin film materials for superconducting radio frequency (SRF) particle accelerators; Design, construction and characterization of PVD equipment for the study and applicability of Energetic Condensation. Optimization of deposition parameters for high quality niobium superconductor thin films. Design, construction and characterization of dual vacuum arc system for deposition of composites films via Energetic Condensation; Deposition and Characterization of epitaxial growth of Nb, Mo-Re and Nb-Sn thin films for superconductivity applications.

Contributions: High quality films with world record results of **RRR (~600)** and vortex penetration **$B_{pen} > 180 \text{ mT}$** , reaching performance of bulk niobium. Parameters study of the conditions needed for growth of almost defect-

free films, with 7000 less hydrogen than bulk niobium. Publication of results in several peer-review journals.

Teaching Experience at *Pontificia Universidad Catolica*, SANTIAGO-CHILE:

Mar 2009 ~ May 2009: Substitute professor, "Physics for Scientists" (FIS 109c).

Mar 2009 ~ Jul 2009: Teaching assistant for Waves and Optics.

Mar 2000 ~ Jul 2009: Laboratory Instructor

- + Advanced Experimental Physics (3 semesters)
- + Modern Physics (4 semesters)
- + Waves and Optics (2 semesters)
- + Electricity and Magnetism (5 semesters)
- + Waves and Heat (3 semesters)

Doctoral Research at *Pontificia Universidad Catolica(PUC)*, SANTIAGO-CHILE:

Mar 2005 ~ Oct 2009: PhD. Student at Department of Optic and Plasma Physics.

Pontificia Universidad Catolica de Chile, Supervisor: Dr. Mario Favre.

Mission: Study of high-frequency discharges for low and high density plasmas.

Contributions: Study of the irradiation of high energy beams onto titanium, silicon substrates to produce TiC-nanotubes and SiC nanostructured thin films. Design and Characterization of PECVD systems excited by radio-frequency power; Construction and optimization of Langmuir probe, including chokes filter, compensation and bias for the characterization of radio-frequency plasmas; Design and construction of a -10KV solid-state square waveform pulse generator; Collection of carbon spheres generated on a hydro-carbon plasma to the deposition of carbon nanostructured films using PBI&D; Study of the effect of energetic condensation in DLC films. Publication of results in several peer-review journals.

Education

Ph.D. Physics / Plasma Physics: Oct 2009. Pontificia Universidad Catolica de Chile, Santiago, Chile. Dissertation title: "*Radiofrequency Plasma: one measurement technique and two experimental methods to fabricate DLC, with and without producing micro/nano-structures*", TUC 2009 V144p.

Advisor: Dr. Mario Favre.

B.S. Physics: Dec 2004, Pontificia Universidad Catolica de Chile, Santiago, Chile.

Thesis title: "*Change of optical properties of palladium upon hydrogenation*", TUC 2004 V1441c. Advisor: Dr. Ulrich Volkmann.

Awards and Honors

- Highest Score Chilean university admission test in mathematics.
- CONICYT scholarship to complete a Doctorate in Physics at the PUC, offered by the Chilean government.

Technical Skills and Training

- Fifteen years' experience in design, build up and operation of UHV apparatus and instrumentation.
- More than 15 years hands-on experience in machine shop, electronic engineering and plasma diagnostics.
- Experienced in materials measurement and characterization, which include but not limited to, Micro-Raman spectroscopy, Optical Ellipsometry, 3D Optical profilometry, nano-thickness characterization by Stylus Surface Profiler, Quadrupole mass spectroscopy (QMS), 2D and 3D Optical Digital Microscopy by HiROX, Scanning Electron Microscopy (SEM), Field-Emission Scanning Microscopy (FESEM), Atomic Force Microscopy (AFM), X-ray Diffraction (XRD) and X-Ray Reflectivity (XRR).
- Proficient in these softwares: Solidworks, Autocad, Matlab, Octave, LabView, Maxima-CAS, Maple, Photoshop, scientific graphing and data analysis using Origin, and MS-Office. Basic knowledge of programming with C, R, Pascal and Python.

Development Experience

- Designed, and lead the construction and testing of an automated vacuum cluster for the production of All-Solid-State Thin-Films Batteries. System is controlled by a robotic arm, and 7 different magnetron plasma sources allow the production of multilayer coatings, where the footprint of each layer is controlled by shadow masks. The project cost is > 1.6 Million USD.
- Design, construction and developing of nanoparticles coatings on the surface of vertical graphene by a vacuum process.
- Design and prototyping of Biosensors made of vertical graphene decorated with nanoparticles of platinum, gold, nickel and enzymes.
- Designed, constructed and developed a multi-cathode planar *vacuum arc* system for the study of epitaxial growth of thin films using energetic condensation, at AASC.
- Optimized the internal structure of the CEDTM vacuum arc thin film deposition system. Developed its datalogging system via LabView, at AASC.
- Designed a *multi-langmuir probe* system to measure the angular distribution of high energy ions from a multi-source vacuum arc system, at AASC.
- Designed, constructed and characterized a -12KV solid-state square waveform pulse generator for PBII&D testing, at PUC.
- Developed and built-up a *PECVD* system excited by radio-frequency.
- Designed, constructed and characterized a filtered and compensated *langmuir* probe for RF and DC plasmas, at PUC. Study of I-V characteristics traces to obtain parameters like density and temperature of plasmas.
- Operated a High Voltage and High Current *Dense Plasma Focus (DPF)* experiment. The use of high energy beams from DPF allows the treatment and modification of surface materials.
- Operated optical spectrometers to measure the production of ozone in a *dielectric barrier discharge, (DBD)*, at atmospheric pressures.
- Optimized design of a coaxial DBD for the maximum production of ozone.
- Design and characterization of several *glow discharges* and a *micro-hollow cathode discharge*.

- Built-up and developed a home-made *ellipsometer* and a *magneto-optical kerr effect* bench, to study the micro-space variations of transparent thin films, at PUC.

Publications in Peer-Reviewed-Journals

1. Jessica Scremin, Isabella V. Joviano dos Santos, Jack P. Hughes, Alejandro García-Miranda Ferrari, **Enrique Valderrama**, Wei Zheng, Xizhou Zhong, Xin Zhao, Robert D. Crapnell, Samuel J Rowley-Neale and Craig E. Banks. "Platinum nanoparticle decorated vertically aligned graphene screen-printed electrodes: electrochemical characterization and exploration towards the hydrogen evolution reaction". Submitted to *Nanoscale Journal* (Impact factor: 6.970). April 22 of 2020.
2. Melody F. Allee, Sarah E. Anderson, Myra J. Bloom, M.A., M.L.I.S., Scarlet R. Jost, M.S., Donald P. Keating III, Andrew S.I.D. Lang, Ph.D., Nancy V. Mankin, M.Ed., Zachary W. Mast, Philip P. Nelson, Ph.D., Esther M. Spear, **Enrique F. Valderrama**, Ph.D. "The Influence of Chronotype and Grit on Lifestyle and Physical Activity". Submitted to *Building Healthy Academic Communities Journal*, April 14 of 2020.
3. Valderrama et al. "A high H₂O₂ sensitivity biosensor made of Vertical Graphene decorated with platinum nanoparticles", in process of writing a patent in China. 2019
4. Valderrama et al. "A single automated vacuum cluster for solid-state thin-film batteries prototyping". In process application of patents in China, 2019.
5. Lang, A. S., **Valderrama, E. F.**, & Holt, C. R. (2018). The number of credit hours required for bachelor's degrees at Christian colleges and universities. *Journal of the Scholarship of Teaching and Learning for Christians in Higher Education*, 8(1), 3-11. <https://doi.org/10.31380/sotlched.8.1.3> Available at: <http://works.bepress.com/andrew-sid-lang/30/>
6. F. Guzman, M. Ruiz, **E Valderrama**, M. Favre, H. Bhuyan, E. S. Wynham, and H. Chuaqui. "Spectroscopic Characterization Of RF Hydrocarbon Plasmas For DLC Coatings," *Journal of Physics: Conference Series* vol. 511, pp. 012017, 2014.
7. **E. F. Valderrama**, C. James, M. Krishnan, X. Zhao, L. Phillips, C. Reece, and K. Seo, "High-RRR thin-films of Nb produced using energetic condensation from a coaxial, rotating vacuum ARC plasma (CEDTM)," in *AIP Conf. Proc. 1434*, vol. 57, pp. 953–960, 2012.
8. M. Krishnan, **E. Valderrama**, C. James, X. Zhao, J. Spradlin, A.-M. Feliciano, L. Phillips, C. Reece, K. Seo, and Z. Sung, "Energetic condensation growth of Nb thin films," *Physical Review Special Topics - Accelerators and Beams*, vol. 15, no. 3, Mar. 2012.
9. M. Krishnan, **E. Valderrama**, B. Bures, K. Wilson-Elliott, X. Zhao, L. Phillips, A.-M. Valente-Feliciano, J. Spradlin, C. Reece, and K. Seo, "Very high residual resistivity ratios of heteroepitaxial superconducting niobium films on MgO substrates," *Superconductor Science and Technology*, vol. 24, no. 11, p. 115002, Nov. 2011.
10. X. Zhao, L. Phillips, C. E. Reece, K. Seo, M. Krishnan, and **E. Valderrama**, "Twin symmetry texture of energetically condensed niobium thin films on sapphire substrate (a-plane Al₂O₃)," *Journal of Applied Physics*, vol. 110, no. 3, p. 033523, 2011.
11. **E. Valderrama**, M. Favre, H. Bhuyan, H. M. Ruiz, E. Wyndham, J. Valenzuela, and H. Chuaqui, "Sub-micron size carbon structures synthesized using plasma enhanced CVD, without external heating and no catalyzer action," *Surface and Coatings Technology*, vol. 204, no. 18–19, pp. 2940–2943, Jun. 2010.
12. H. Bhuyan, M. Favre, A. Henriquez, G. Vogel, **E. Valderrama**, E. Wyndham, and H. Chuaqui, "Production of sub-micron size carbon composites by high energy carbon ion beams irradiation of solid targets," *Surface and Coatings Technology*, vol. 204, no. 18–19, pp. 2950–2953, Jun. 2010.
13. H. Bhuyan, M. Favre, **E. Valderrama**, A. Henriquez, G. Vogel, H. Chuaqui, E. Wyndham, A. Cabrera, E. Ramos-Moore, P. A. Núñez, H. Kelly, D. Grondona, and S. Goyanes, "High energy ion beam irradiation on titanium substrate in a pulsed plasma device operating with methane," *Journal of Physics D: Applied Physics*, vol. 42, no. 20, p. 205207, Oct. 2009.

14. H. Bhuyan, M. Favre, **E. Valderrama**, G. Avaria, E. Wyndham, H. Chuaqui, J. Baier, H. Kelly, D. Grondona, and A. Marquez, "Formation of sub-micron size carbon structures by plasma jets emitted from a pulsed capillary discharge," *Applied Surface Science*, vol. 255, no. 6, pp. 3558–3562, Jan. 2009.
 15. H. Bhuyan, M. Favre, **E. Valderrama**, G. Avaria, F. Guzman, H. Chuaqui, I. Mitchell, E. Wyndham, R. Saavedra, and M. Paulraj, "Effect of high energy ion irradiation on silicon substrate in a pulsed plasma device," *Applied Surface Science*, vol. 254, no. 1, pp. 197–200, Oct. 2007.
 16. H. Bhuyan, M. Favre, **E. Valderrama**, G. Avaria, H. Chuaqui, I. Mitchell, E. Wyndham, R. Saavedra, and M. Paulraj, "Formation of hexagonal silicon carbide by high energy ion beam irradiation on Si (1 0 0) substrate," *Journal of Physics D: Applied Physics*, vol. 40, no. 1, pp. 127–131, Jan. 2007.
 17. H. Bhuyan, M. Favre, **E. Valderrama**, H. Chuaqui, and E. Wyndham, "Experimental studies of ion beam anisotropy in a low energy plasma focus operating with methane," *Journal of Physics D: Applied Physics*, vol. 39, no. 16, pp. 3596–3602, Aug. 2006.
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Papers Published in National and International Conferences

1. **E. Valderrama** and A. Sweet, "Virtual Environment to Simulate Plasma Physics Dynamics using ES-PIC". Accepted for publication but we did not attend to the 35th International Electric Propulsion Conference, October 2017, Atlanta GA, USA.
2. **E. Valderrama**, "Micro Vacuum Arc for micro-nano satellite propulsion", 37th annual Oklahoma AIAA/ASME Symposium, April 2017, Tulsa OK, USA.
3. J. Fitzgerald, C. Nwokolo and **E. Valderrama**. "Synthesis of Silver Nanoparticles", Presentation at the ORU Engineering advisory board meeting. November 2013, Tulsa OK, USA.
4. J. Fitzgerald, C. Nwokolo and **E. Valderrama**. "Synthesis and Utilization of Silver Nanoparticles", Presentation on the AIAA/ASME Symposium at Oklahoma Christian University. March 2014, Edmond OK, USA.
5. C. Nwokolo, J. Fitzgerald and **E. Valderrama**. "Synthesis of silver nanoparticles for use in the medical field", Poster Presentation on the 2014 Student Professional Development Conference (SPDC) -Texas Tech. April 2014, Lubbock TX, USA.
6. C. Nwokolo, J. Fitzgerald and **E. Valderrama**. "Synthesis and utilization of silver nanoparticles", Presentation at the ORU Engineering seminar. April 2014, Tulsa OK, USA.
7. T. Tajima, N. Haberkorn, L. Civalé, D.J. Devlin, M.E. Hawley, R.K. Schulze, C. James, M. Krishnan, **E. Valderrama**, B.H. Moeckly, C. Yung, T. Tan, X. Xi and A. Matsumoto, "Vortex Penetration Field of Thin Films Made of Nb, MgB₂ and Nb₃Sn as a Material for SRF Cavities", Conference: 24th International Cryogenic Engineering Conference-International Cryogenic Materials Conference 2012, ICEC24-ICMC2012, 17D-OR5-06. May 14 - 18, 2012. Fukuoka, Japan.
8. T. Tajima, N.F. Haberkorn, L. Civalé, M. Hawley, **E. Valderrama**, M. Krishnan, "Bulk-like Nb Films might be Possible with Coaxial Energetic Deposition for Superconducting RF Cavities". Conference: 58th Annual International Symposium and Exhibition, AVS-58th, VT-TuP10. October 30 - November 4, 2011. Tennessee, USA.
9. **E. Valderrama**, C. James, M. Krishnan, X. Zhao, L. Phillips, C. Reece and K. Seo, "High RRR Thin Films of Nb Produced using Energetic Condensation from a Coaxial, Rotating Vacuum Arc Plasma (CED™)" Conference: Cryogenic Engineering Conference and International Cryogenic Materials Conference, CEC-ICMC-11. June 13-17, 2011. Spokane, USA.
10. **E. Valderrama**, C. James, M. Krishnan, X. Zhao, K. Seo, F. A. Stevie and P. Maheshwari, "Nb film growth on crystalline and amorphous substrates". Conference: 15th International Conference on RF Superconductivity, SRF-11, THPO069. July 25-29, 2011. Chicago, USA.
11. **E. Valderrama**, C. James, M. Krishnan, X. Zhao, K. Seo, F. A. Stevie and P. Maheshwari, "Mo-Re films for SRF applications". Conference: 15th International Conference on RF Superconductivity, SRF-11, THPO077. July 25-29, 2011. Chicago, USA.

12. M. Krishnan, **E. Valderrama**, C. James, X. Zhao, J. Spradlin, A-M Valente Feliciano, L. Phillips, C. Reece, Z.H. Sung, F.A. Stevie, P. Maheshwari, D. Batchelor, "Energetic Condensation of Nb thin films". Conference: 15th International Conference on RF Superconductivity, SRF-11, TUIOB01. July 25-29, 2011. Chicago, USA.
13. K. Seo, M. Krishnan, **E. Valderrama**, X. Zhao, A-M. Valente-Feliciano, J. Spradlin, L. Phillips, C. Reece, "Crystallographic Orientation of Epitaxial Transition Observed for Nb (bcc) on MgO and Cu (fcc) Single-crystals". Conference: 15th International Conference on RF Superconductivity, SRF-11, THPO042. July 25-29, 2011. Chicago, USA.
14. M. Krishnan, **E. Valderrama**, C. James, B. Bures and K. Wilson Elliott, X. Zhao, L. Phillips, B. Xiao, C. Reece and K. Seo, "Energetic Condensation Growth of Nb films for SRF accelerators". Thin Films and New Ideas for Pushing the Limits of RF Superconductivity, October 4-6, Legnaro National Laboratories, Padua, Italy.
15. K. Seo, X. Zhao, L. Phillips, J. Spradlin, C. Reece, M. Krishnan and **E. Valderrama** "Texture study of energetic condensed Niobium (Nb) thin films". Thin Films and New Ideas for Pushing the Limits of RF Superconductivity, October 4-6, Legnaro National Laboratories, Padua, Italy.
16. **E. Valderrama**, M. Favre, H. Bhuyan, E. Wyndham, J. Valenzuela and H. Chuaqui, "Sub-Micron Size Carbon Structures Synthesized Using Plasma Enhanced CVD, Without External Heating and No Catalyzer Action". Conference: 10th International Workshop on Plasma Based Ion Implantation and Deposition (PBII&D 2009). September 7-11, 2009. Sao Jose dos Campos, SP, Brazil.
17. H. Bhuyan, M. Favre, A. Henriquez, G. Vogel, **E. Valderrama**, H. Chuaqui and E. Wyndham, "Production of Carbon Nanocomposites by High Energy Carbon Ion Beams Irradiation of Solid Targets". Conference: 10th International Workshop on Plasma Based Ion Implantation and Deposition (PBII&D 2009). September 7-11, 2009. Sao Jose dos Campos, SP, Brazil.
18. **E. Valderrama**, M. Favre, H. Bhuyan, J. Valenzuela, E. Wyndham and H. Chuaqui, "Plasmas de Radiofrecuencia, Caracterizacion y Aplicacion". Conference: XVI Simposio Chileno de Fisica. November 12-14, 2008. Valparaiso, Chile.
19. **E. Valderrama**, J. Valenzuela, H. Bhuyan, M. Favre, E. Wyndham and H. Chuaqui, "Parameters scan of carbon coatings on silicon substrate by plasma immersion ion implantation in a rf plasma". Conference: The 35th IEEE International Conference on Plasma Science (ICOPS). June 15-19, 2008. Karlsruhe, Germany.
20. A. Henriquez, H. Bhuyan, M. Favre, **E. Valderrama**, G. Vogel, H. Chuaqui and E. Wyndham, "Evolucion Espacial y Temporal de Haces de Iones y su uso en la Implantacion sobre Blancos de Titanio mediante Descarga Plasma Focus". Conference: XVI Simposio Chileno de Fisica. November 12-14, 2008. Valparaiso, Chile.
21. H. Bhuyan, M. Favre, A. Henriquez, **E. Valderrama**, H. Chuaqui and E. Wyndham, "Formation of TiC coatings by high energy plasma focus carbon ion beams". Conference: The 35th IEEE International Conference on Plasma Science (ICOPS). June 15-19, 2008. Karlsruhe, Germany.
22. H. Bhuyan, M. Favre, E. Wyndham, G. Avaria, **E. Valderrama**, H. Chuaqui and J. Baier, "Formation of carbon nanostructures by the plasma jets emitted from a pulsed capillary discharge at low pressures". Conference: 28th ICPIG (International Conference on Phenomena in Ionized Gases). July 15-20, 2007. Czech Republic, Prague.
23. M. Favre, P. Choi, E. Wyndham, G. Avaria, H. Bhuyan, H. Chuaqui, A.M. Lenero, H. Ruiz, **E. Valderrama**, R. Aliaga-Rossel, S. Zakharov, Y. An, C. Dumitrescu, C. Leblanc, O. Sarroukh, and V. Zakharov, "Compact capillary discharges as sources of EUV radiation and plasma jets: physics and applications". Conference: 28th ICPIG (International Conference on Phenomena in Ionized Gases). July 15-20, 2007. Czech Republic, Prague.
24. M. Favre, H. Bhuyan, **E. Valderrama**, F. Guzman. "Physical properties and potential applications of plasma focus ion beams". Conference: APS 2006 - 48th Annual Meeting of the Division of Plasma Physics. October 30 - November 3, 2006. Philadelphia, Pennsylvania USA.
25. H. Bhuyan, M. Favre, **E. Valderrama**, G. Avaria, H. Chuaqui, I. Mitchell, E. Wyndham, R. Saavedra and M. Paulraj. "Formation of hexagonal silicon carbide by high energy ion irradiation on silicon(100) substrate". Conference: 13th International conference on Solid Films and Surfaces. November 6-10, 2006. Bariloche, Argentina.

26. H. Bhuyan, M. Favre, **E. Valderrama**, G. Avaria, H. Chuaqui, I. Mitchell, E. Wyndham, R. Saavedra and M. Paulraj. "Physics and Applications of High Energy Ion Beams Emitted from Low Energy Plasma Focus Discharges". Conference: 16th international conference on high power particle beams (BEAMS 2006). July 9-13, 2006. Oxford, United Kingdom.
27. H. Bhuyan, M. Favre, H. Chuaqui, **E. Valderrama**, I. Mitchell, E. Wyndham. "Anisotropy Of Ion Emission From a Low Energy Plasma Focus". Conference: XI Latin American Workshop on Plasma Physics. December 5-9, 2005. Mexico.
28. H. Bhuyan, **E. Valderrama**, M. Favre, H. Chuaqui, I. Mitchell and E. Wyndham. "Plasma Properties of a DC Hollow Cathode Discharge". Conference: XI Latin American Workshop on Plasma Physics. December 5-9, 2005. Mexico.
29. **E. Valderrama**, U. Volkmann, R. Matelon. "Estudio de las propiedades opticas del Paladio Hidrogenado". Conference: XIV Simposio Chileno de Fisica. November 17-19, 2004. Chile.
30. C. Hidalgo, P. Soza, F. Pacheco, E. Cisternas, **E. Valderrama**, M. Pino, J. Swerts, y U. Volkmann (PUC), J. Swerts, K. Temst, C. Van Haesendonck (Katholieke Universiteit Leuven): "Fe Films on SiO₂, MgO, and SiO₂/Ag Substrates Studied by the Magneto-optical Kerr Effect (MOKE)". Conference: APS Meeting. March 3-7, 2003. Austin, Texas, USA.
31. C. Hidalgo, P. Soza, F. Pacheco, E. Cisternas, **E. Valderrama**, M. Pino, J. Swerts, y U. Volkmann. "Estudio de las propiedades del Fe(30nm) sobre superficies de MgO, SiO₂/Ag(10nm) y SiO₂/lineas de plata". Conference: XIII Simposio Chileno de Fisica. November 13-15, 2002. Concepcion, Chile.

Oral Presentations

- 1 "Setting a ultra-high-vacuum experiment for nano-biosensors prototyping". Gabriela Garcia, Colin Sheehan, Enrique Valderrama. Presenting at the Computing and Mathematics Seminar at ORU. April 1st 2020, Tulsa OK, USA
- 2 "Vacuum Cluster, Magnetron Sputtering and Robotic Arms" Exhibitor at 64th American Vacuum Society (AVS) International Symposium and Exhibition, October 29 - November 3, 2017 Tampa Convention Center • 333 S. Franklin Street • Tampa, Florida 33602, USA
- 3 "Micro Vacuum Arc for micro-nano satellite propulsion", presentation for the 37th annual Oklahoma AIAA/ASME Symposium, April 2017, Tulsa OK, USA.
- 4 "Multiculturalism in science and engineering: Research and science in Chile and the United States", talk for the College of Science and Engineering in celebration of Multicultural Week at ORU, January 18, 2017.
- 5 "Beauty in Sciences. Studying it can be an Act of Worship", workshop for pastors, at the ORU Hammer Center, January 3, 2014.
- 6 "Advanced Materials: Superconducting thin films", talk for the *American Scientific Affiliation* at the Graduate Center of Oral Roberts University, Tulsa, Oklahoma. October 4, 2013.
- 7 "Plasma and Nanotechnology", talk for *Seminars of Nanotechnology* at the Graduate Center of Oral Roberts University, Tulsa, Oklahoma. February 3, 2010.
- 8 "Radiofrequency Plasma: one measurement technique and two experimental methods to fabricate DLC, with and without producing micro/nano-structures", talk for Ph.D. dissertation, at Pontificia Universidad Catolica de Chile, Santiago, Chile. October 26, 2009.
- 9 "Sub-Micron Size Carbon Structures Synthetized Using Plasma Enhanced CVD, Without External Heating and No Catalyzer Action", talk on the 10th International Workshop on Plasma-Based Ion Implantation and Deposition, Sao Jose dos Campos, Brazil. September 10, 2009.
- 10 "Plasma Focus, a high flux and energy, ion-source", talk for *Ph.D. seminars* at Pontificia Universidad Catolica de Chile, Santiago, Chile. March 2007.
- 11 "Change of optical properties of palladium upon hydrogenation", talk in the symposium of the Chilean society of Physics (SOCHIFI), Antofagasta, Chile. November 2004.

Reviewer Experience

Article reviewer for IEEE Conference on Nanotechnology; reviewed article on thermoelectricity of nanostructured materials, 2012.

Professional Activities

Senate member for the Computer and Mathematics department during (2014-2015)

Member of the International Association of Mathematical Physics, IAMP. (2014-2017)

Session Chair for on the 2015 ASA Annual Meeting hosted at ORU. (2015)

Member of TAA, Textbook & Academic Authors Association. (2017)

Session Chair for the 37th annual Oklahoma AIAA/ASME Symposium, April 2017, Tulsa OK, USA.

Member of the committee to study change policy from 128 hours to 120 hours minimum. (2017)

Kappa Mu Epsilon, Corresponding Secretary for the KME Chapter at ORU.(2020-now)

References

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